

CCACACCTAATCTAAGTATATATATCCAATCAATTGTACCAAAG 5985  
 TAGTCTGGAATCATGGTTGTCAATCGGTGCTGTGTTCCCTCCATAT 6030  
 TCTTGACATGATTTGACTTGTCCGGTCCGCGCGACACACGATGTT 6075  
 GATCATAATGAAGGAGTGTTGATTTTGAGTAGGAAAAGATATTGC 6120  
 AGTTCCTTGTAAGATCGTTCGGAACGAAACCCGGCTGGAGTATG 6165  
 ATTTGTTTCGTGGACCCGAAGTGCAAAAATGCCGGAATTAATGACA 6210  
 GGCATTCTCTTCAGTTGGCTTGGGTTGAGATATTGGTCTGCGTCT 6255  
 GTTGGAAGCTGACATTGGATCTTCAACATGCTTTTGCCGCGACC 6300  
 CAGATGGTTGCGCATAAGGCAGCGCTGACTCCCGAGTATGCGAAA 6345  
 ACCTCGAGCCACGAAACATCAGGGTCCATTTCCGTTGAGTCGATC 6390  
 AATTTAGCGGCTGCGAGCATCTTGAGAGTTTTGGGATAAGTCTTT 6435  
 GAGTGGACAACAGTAATGTGATATGGTATGATCTGATGTCGTGTT 6480  
 CGTGTTGATGAGAATAAATTGTTGAGCTGATTCCCATCGGCTCTG 6525  
 ACCAACAGTTAATATCTAAATTCTTCTACTATCTATGCACTATGG 6570  
 ACTGGGGAGTCAACGTTGTTTCGTTCTCTGGAGAGAGGCCTAAATG 6615  
 ATCTTGAATTGGTGTGTAACGTAACGTCAGTAGAAGGCCTGAAT 6660  
 TCGCAAGCGCCGAACCTCCGGCCTACACTGCCACTGACTTTGCGG 6705  
 CTCAGCATTTAGATAGTGGGCTTCACAGCGGGTATTGTCTCTTCT 6750  
 GCAGCATTGCTACGGATTTATCGGCTTCAACAACCCTTGCTGAAC 6795  
 CAATGATGGGTTACATTGATGGGCATTCGTTTTTAACTTTTGTC 6840  
 AGGTTGGCAGAGGCCTAAATCTGCCGTCGGTGTGTGAGAGACCA 6885  
 TGAATCAGGCCCTGCATTAATGTAGGGCATTGCTAGCCCGCGG 6930  
 CAAGAGCGCAGAAAGC 6946

Fig. 2E

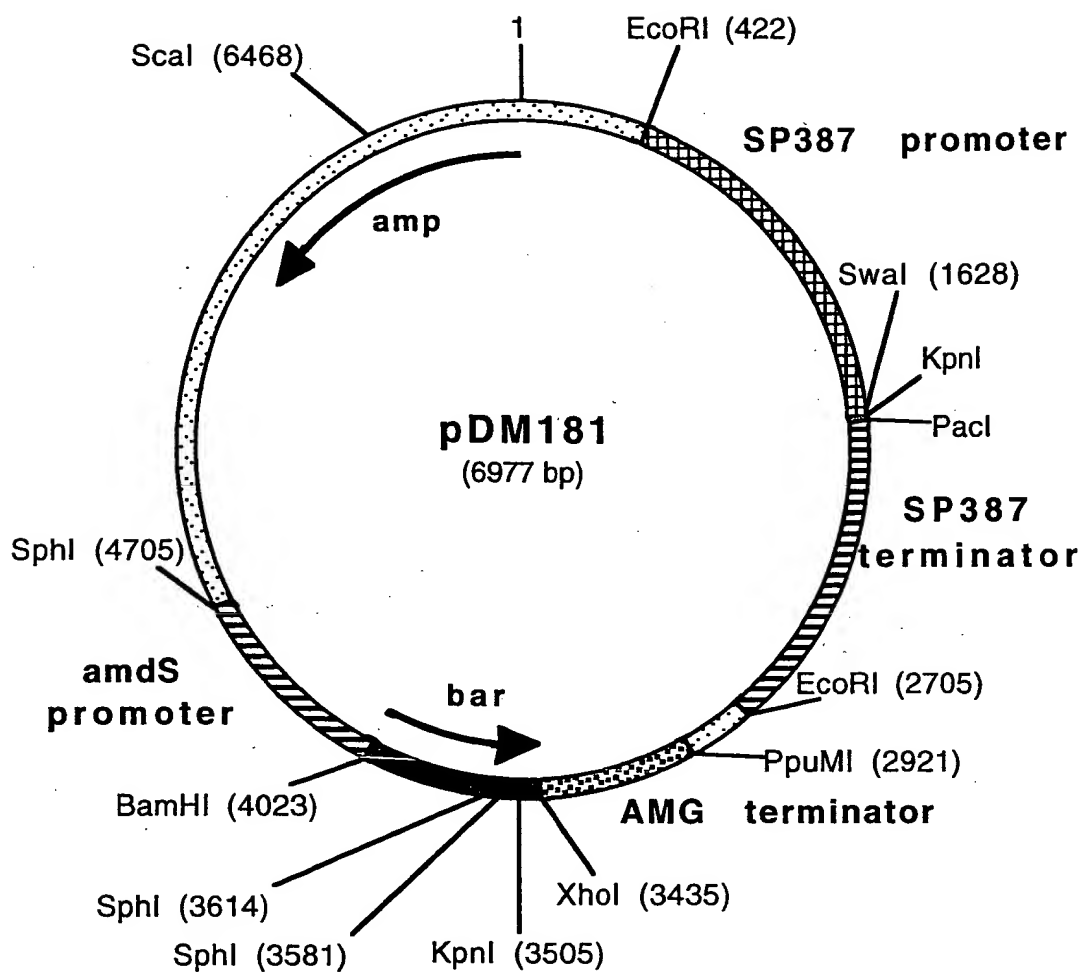


Fig. 3

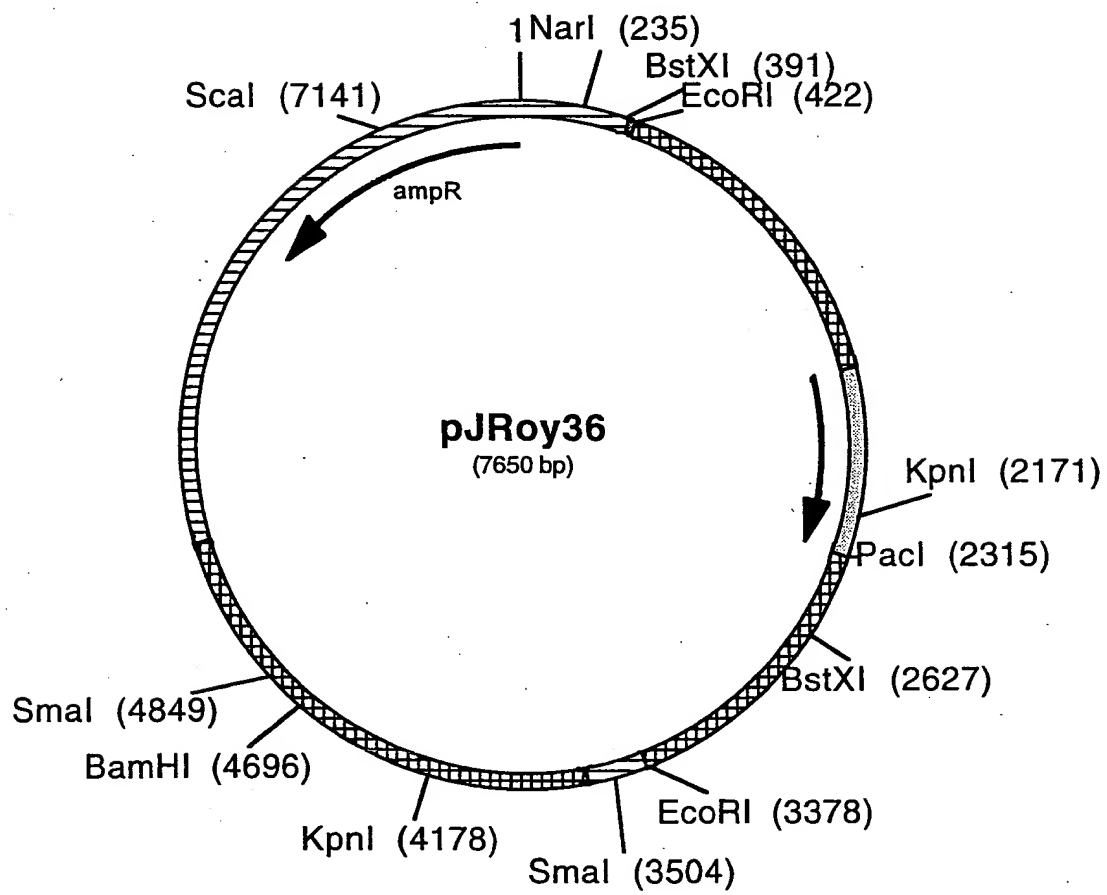


Fig. 4

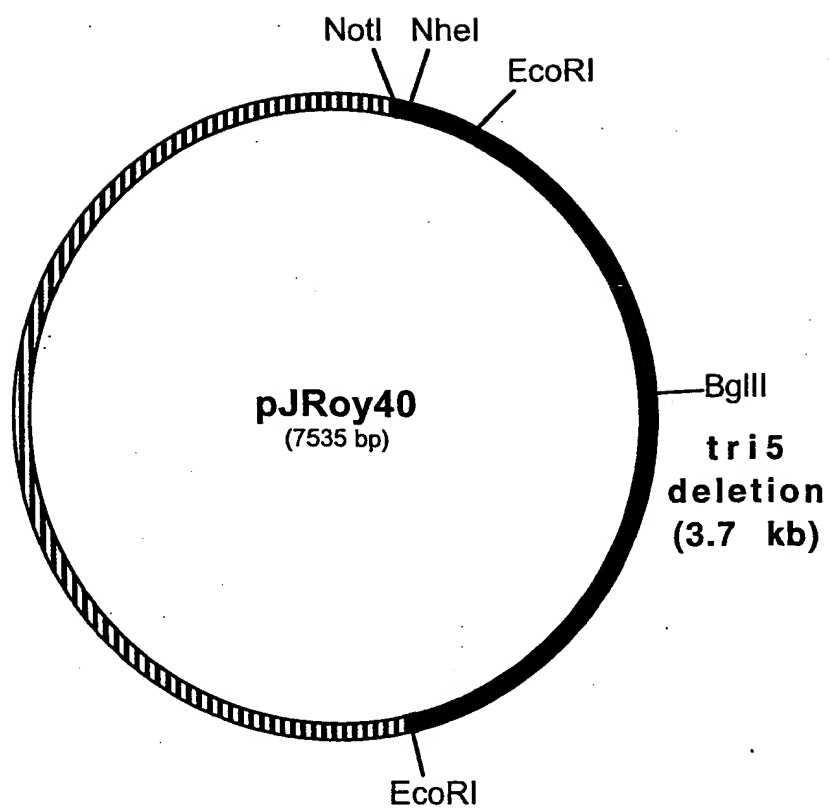


Fig. 5

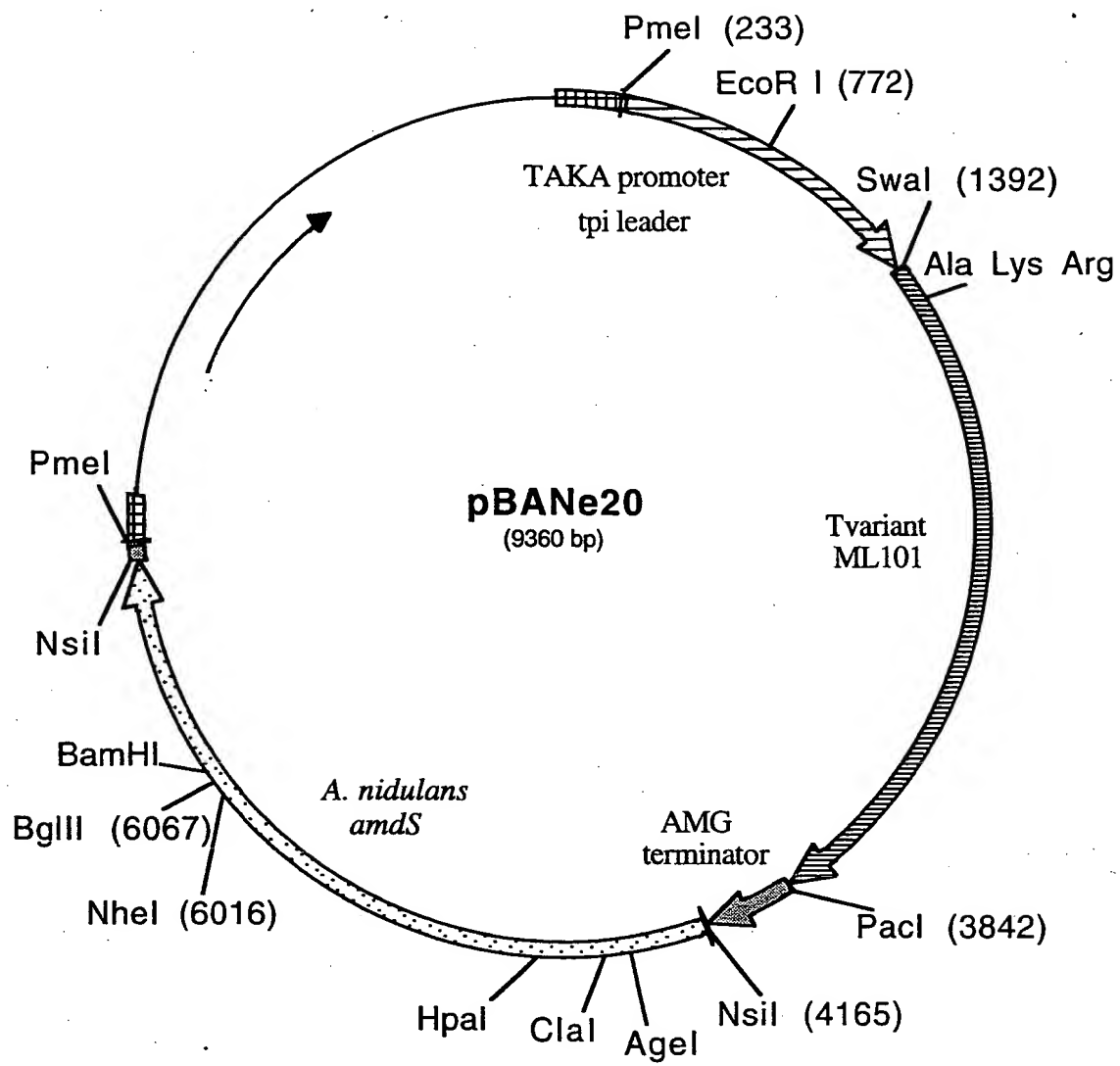


Fig. 6

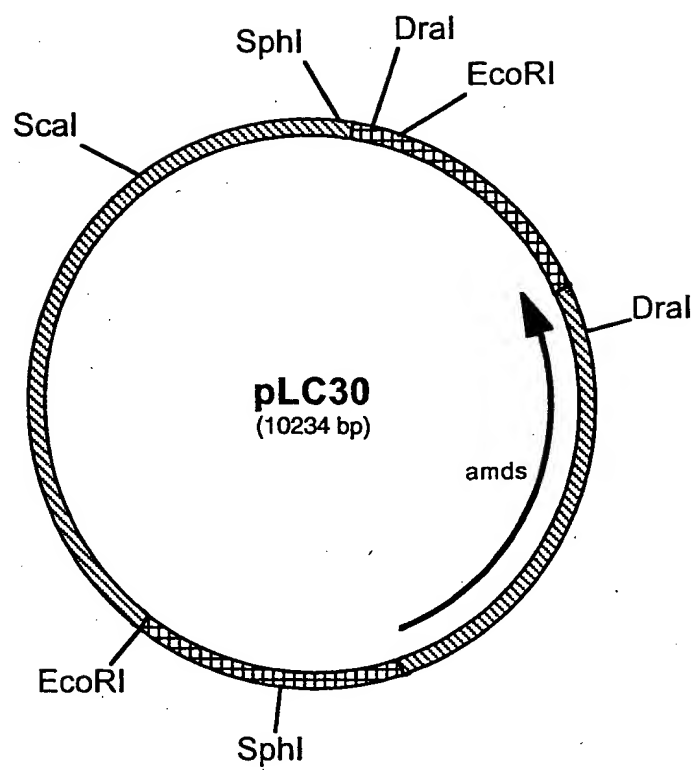


Fig. 7

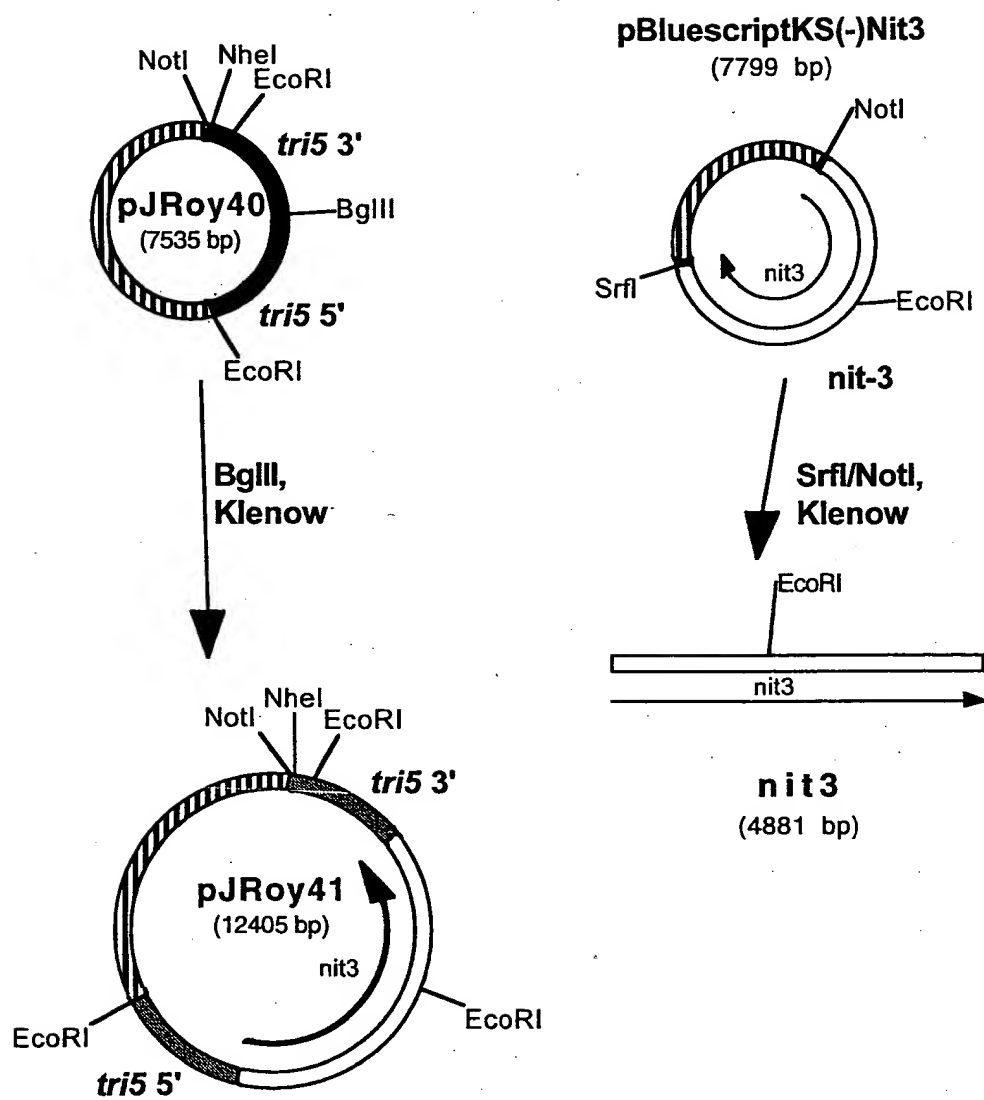
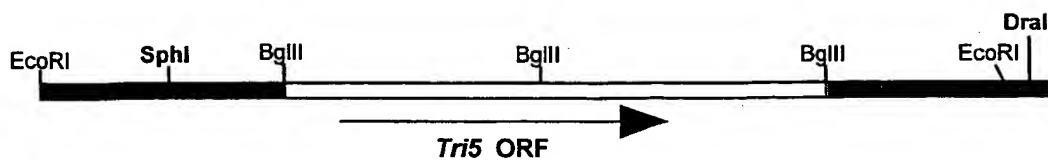
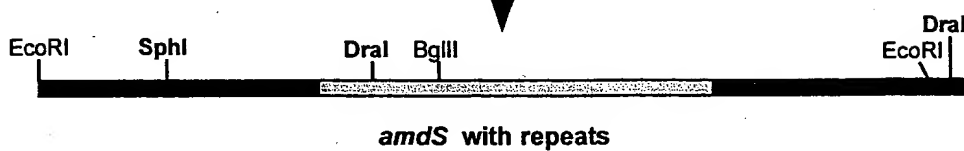


Fig. 8

Wild type *tri5* region



*tri5* deletion and replacement  
with the *amdS* marker



*amdS* loop-out



deletion with single repeat

Fig. 9



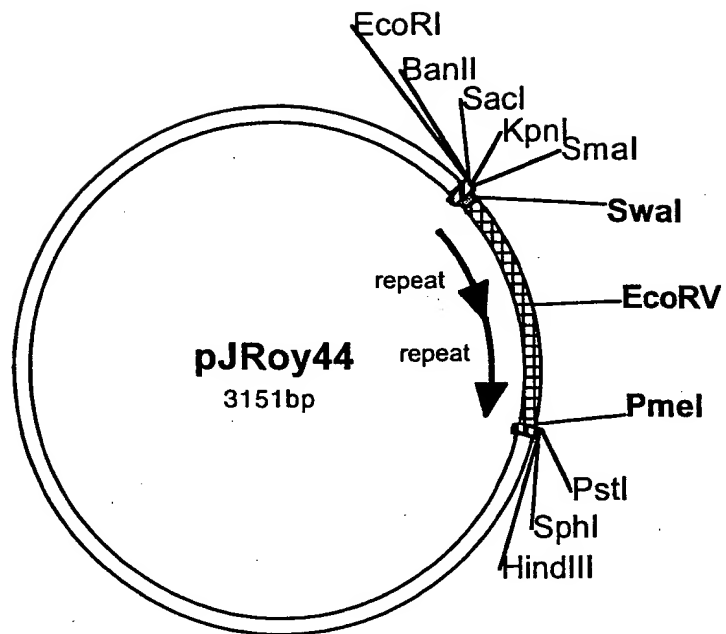


Fig. 10

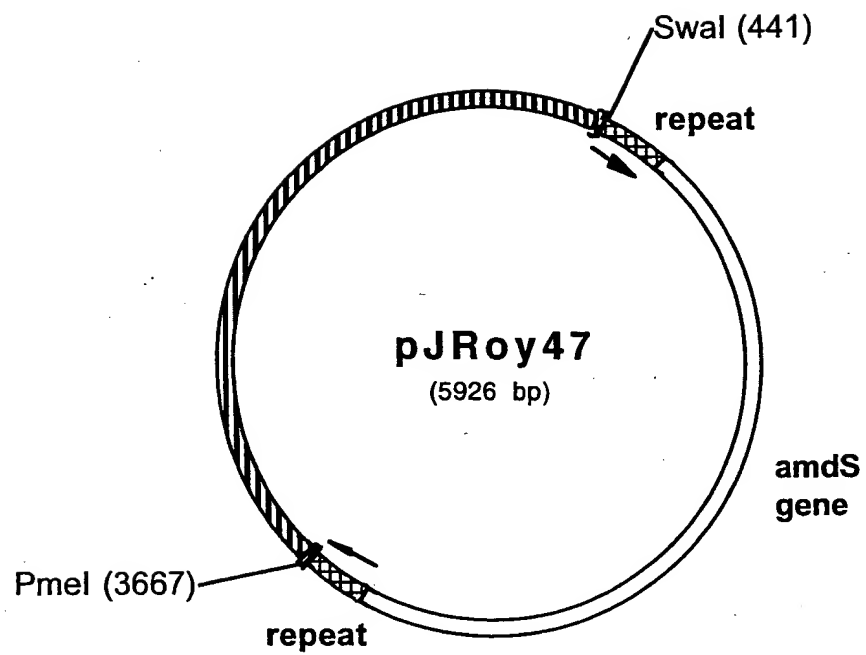


Fig. 11

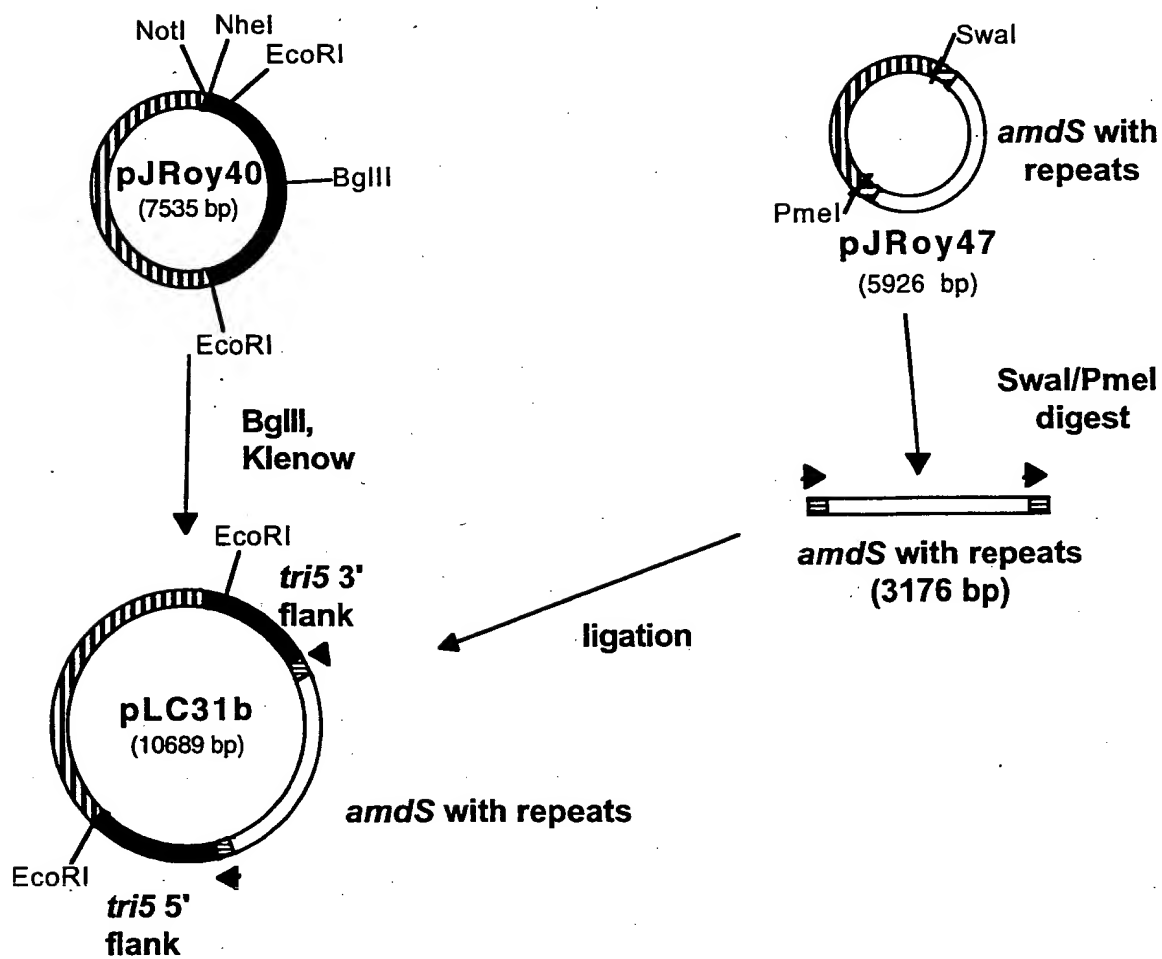
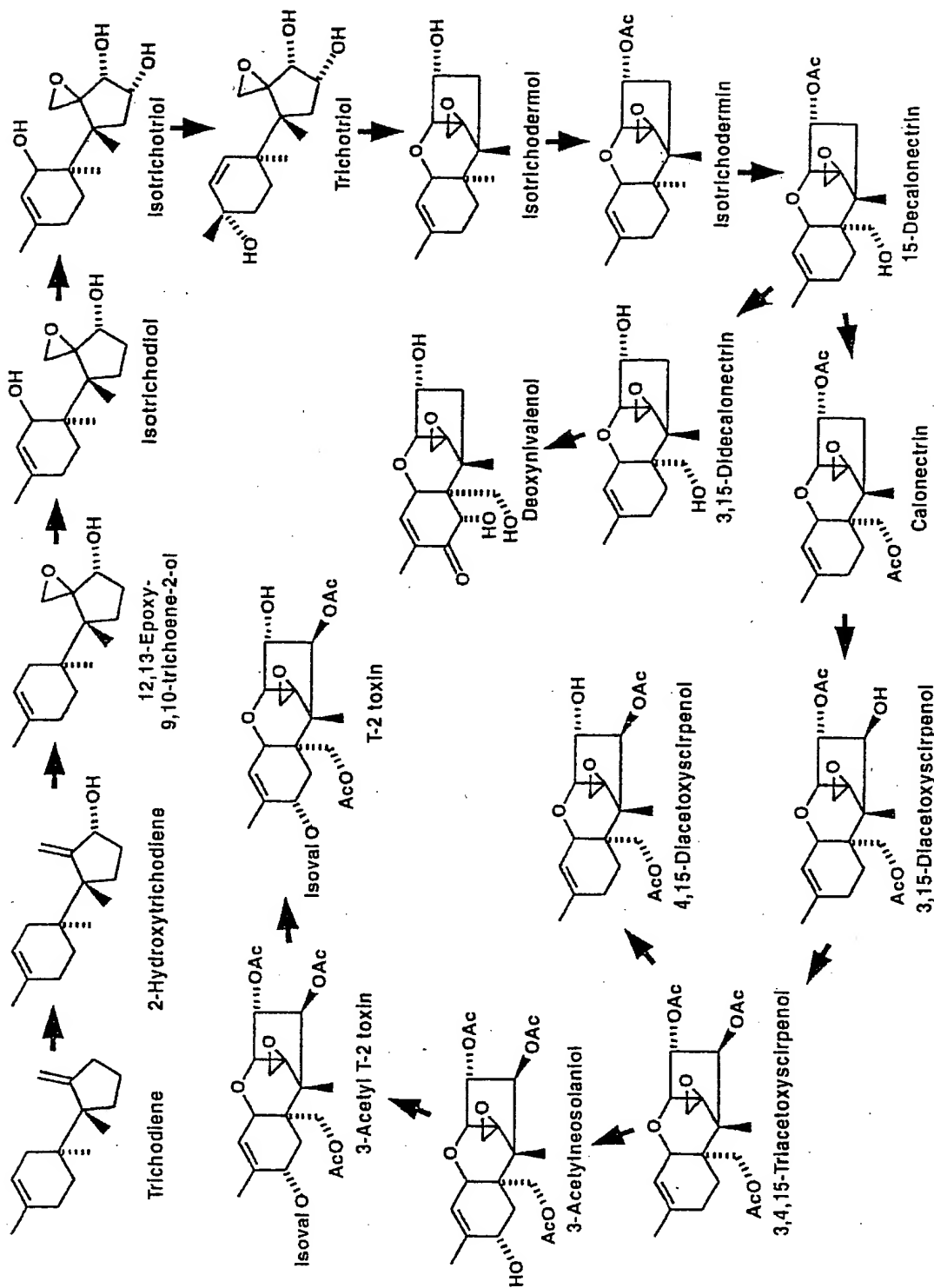


Fig. 12



# Fi

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CCCGCGCTTGGCTACCTATGCCACACACAAAGCTTCATGTTTGGT 90  
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TATGGATGTAATAAAACAAATGTTCCGACCTATTATGCCGAGTTAC 180  
CGTGGACAATTATCGGGCCGGAAGAATGCATTTGTGAATTGTA 225  
ATCCTGCCTGTTTGTGGAGTGATAAGTGACATATTGGAAAAGTCG 270  
TCAAGCAATTGGAGGTTTCATCAACTGTGGAGTCATCGTTTTGGG 315  
CAAACAATACTATGTAGGGTAGGCTTCTGCTGCAGCATCAATGAC 360  
TCGTTTGGATCGAGTCCTTTTGTGTCGAAGCGTATGGGGCCTGC 405  
AGGGAACGAGTCAGTCGTATCAGGCCGGTGAGGCAAATGCCGTTT 450  
CGCAGCAGCTATCATTTGTGCGGGATTTTCGCGAAGCTTTGCGT 495  
GACGAGTCAAATCCGCACATCTTGATTTCATGAGTTGTTGAATTTA 540  
GCTGTTTCATTTCGTGAGTGGCTAAAGCGTATCTAGTCGATTGTCAA 585  
ATTCAGACTTGACAGGTCCCTTGATGAATGAGACGTCGGATGTCC 630  
CTAGCCGAGATGCGGATTGTGACAACGGAAGAGACAGGGGCAGGG 675  
TTCATGGGTGTTGAACCTTGTTCACTGAAACGGTGATGTCTTTGG 720  
TCTACAAAGTATCCTTCACATGTCTCTGTTCCCAGACCACGTGGT 765  
TATTCTGGCATCCGGGTCCTATTGATTGGCTGATTTCTTGCACTG 810  
ATACATACAAATAAGTCCAAGACTGTATTCTACTGGCAAATATAT 855  
GCCGACAAGGGGAAATCATTCTGAATTAGTGATGAAGCATGCCGT 900  
CGAAGCCGAAGAGAACTTTGCGCAGCAACTGGAAAGACCTGTGG 945  
GCTGTAGAGCGCACAGCACGGTAGTAAGACCTACGGCCCTGGTAT 990  
CATGGTTGTAGCCTCTTCCGTATTGCTCACATATCCACCGGTTTT 1035  
CTACATAAACAGTCTGAGTCCTGATAGTGGATATTATATCTTCCA 1080  
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AGAGATCGCTTAGCCTCCAGCCTGGCAATATCGCGGCTTCCTCAG 1170  
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ATTTGCTAGTGCGACGGGACTTGCCAGGCTTACGGCACCTACAAG 1260  
TCGCGCCAGCCTTCTGACAGTGATTGTATGCAAGATCGTCATTAG 1305  
TTATGATTAAGCTTTGATAAACAAGAGCGCCACAGCCTTTCTTTA 1350  
ACTCCGACAACCTCAACGGTGACATGCATACCGCGTGACACTATT 1395  
TCCCATGGTGTGAACACCATCAATGACTTAGAGTAGATAACCACT 1440  
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AAGTCCTTCAAACGTGGGGACGGATTTAACCAACAGCAGAGTGGA 1620  
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TACATACGCAGCTTTTCAAGGCACAGATAACGAAGATCTTAGGGTAG 1710  
ATTCCAAAACATCGGAAGGGGTCACAGATCGCACTAGCTACTATG 1755  
CCATCCAGAGCCTCTTGCTAACCAAACAGAGCTAAGTCGCTTAAC 1800

Fig. 2A

CCTTATTCAAAGAACACAGTTGTATTGTGCATCCGGGATCTAACT 1845  
GTCTTGGACAAGCGTGTCTGTATCCGTAACGGCTGGTGGTTTTG 1890  
TAGGGTATGATAGAATGGTTGCACTTAAGGCCTGTCGACTAGGTA 1935  
AGCTTTTCCCAGGGAAGAATAAAACACCGCGGCTGCTTAGACAAG 1980  
TGAGGCTTTCTTCTCCGTCAACAACTGCCGTCTCACTAGTCCAA 2025  
ACTTGGTCACGGACAACAGCCGAACCTCAAACATTTAGCCTCAGGA 2070  
TTCATCCCTAGCTTTAGGCCTACTCCTCGTCCCTTGACACCGGGA 2115  
TGTAGTTCCTATCGCTTGCGTAGCTCTTTACTGCATGTGCCGAGC 2160  
TAAAGATAAAATCGGACTAAAGATTTCGTTCCGGGAGCCGAATGCT 2205  
TTCTCAAGCTCGTCGTGTTGCAGGGGATGGAAGACCTCCAGCGTA 2250  
CGTCACGGTCTCTATCACTACGAATTTGCTGGGAAGGCTATTTGC 2295  
ATTAATGTCAAGTCAATTATTAGGCCTAACAACACAAGTTTAACT 2340  
AAAGATTGTGGATGGTTGACATTTGCCATATGTTGATATATAGTT 2385  
GATAGCAACAGCACTTTGCAATAGGACAATAATAGCGACTTGACT 2430  
TGAAAATTCGCAAAGAACTGTTATAAATCATTATAACCATTATCAT 2475  
CATGGAGAACTTTCCCACTGAGTATTTTCTCAACACTTCTGTGCG 2520  
M E N F P T E Y F L N T S V R  
CCTTCTCGAGTACATTTCGATACCGAGATAGCAATTATACCCGGGA 2565  
L L E Y I R Y R D S N Y T R E  
AGAGCGTATCGAGAATTTGCACTATGCTTACAACAAGGCTGCTCA 2610  
E R I E N L H Y A Y N K A A H  
TCACTTTGCTCAGCCACGACAACAGCAGCTGCTCAAGGTAGACCC 2655  
H F A Q P R Q Q Q L L K V D P  
TAAGCGACTACAGGCTTCCCTCCAACTATTGTTGGCATGGTGGT 2700  
K R L Q A S L Q T I V G M V V  
ATACAGTTGGGCAAAGGTCTCCAAAGAGTGTATGGCGGATCTATC 2745  
Y S W A K V S K E C M A D L S  
TATTCATTACACGTACACACTCGTTTTGGATGACAGCAGCGATGA 2790  
I H Y T Y T L V L D D S S D D  
TCCGTATCCAGCCATGATGAACTATTTCAACGATCTTCAGGCTGG 2835  
P Y P A M M N Y F N D L Q A G  
ACGAGAACAGGCCCACCCATGGTGGGCGCTTGTTAATGAGCACTT 2880  
R E Q A H P W W A L V N E H F  
TCCCAATGTCCTTCGACATTTTGGTCCCTTCTGCTCATTGAACCT 2925  
P N V L R H F G P F C S L N L  
TATCCGCAGCACTCTTGACTGTAAGTACCCTGGCTCTATTATTTC 2970  
I R S T L D  
ACCGCCTTAATAAGCTAACAGTGATGGAATTATAGTTTTTGAGGG 3015  
F F E G

Fig. 2B

ATGCTGGATCGAGCAGTACAACCTTTGGAGGATTTCCAGGATCTCA 3060  
 C W I E Q Y N F G G F P G S H  
 TGACTATCCTCAGTTTCTTCGACGCATGAATGGCTTGGGTCACTG 3105  
 D Y P Q F L R R M N G L G H C  
 TGTCTGGGGCTTCTTTGTGGCCCAAAGAGCAGTTTGATGAGAGAGG 3150  
 V G A S L W P K E Q F D E R G  
 TCTATTCCTTGAAATCACATCAGCCATTGCTCAGATGGAGAACTG 3195  
 L F L E I T S A I A Q M E N W  
 GATGGTCTGGGTCAATGATCTCATGTCTTTCTACAAGGAGTTCTGA 3240  
 M V W V N D L M S F Y K E F D  
 TGATGAGCGTGACCAGATCAGTCTCGTCAAGAACTACGTCGTCTC 3285  
 D E R D Q I S L V K N Y V V S  
 TGATGAGATCACTCTCCACGAAGCTTTAGAGAAGCTCACCCAGGA 3330  
 D E I T L H E A L E K L T Q D  
 CACTCTACACTCGTCCAAGCAGATGGTAGCTGTCTTCTCTGACAA 3375  
 T L H S S K Q M V A V F S D K  
 GGACCCCTCAGGTGATGGACACGATTGAGTGCTTCATGCACGGCTA 3420  
 D P Q V M D T I E C F M H G Y  
 TGTACGTGGCACTTGTGCGATCACAGGTACCGTCTGAATGAGAT 3465  
 V T W H L C D H R Y R L N E I  
 CTACGAAAAGGTCAAAGGACAAAAGACCGAGGACGCTCAGAAGTT 3510  
 Y E K V K G Q K T E D A Q K F  
 CTGCAAGTTCTATGAGCAGGCTGCTAACGTCCGAGCCGTTTCGCC 3555  
 C K F Y E Q A A N V G A V S P  
 CTCGGAGTGCGCTTATCCACCTATTGCGCAACTGGCAAACATTTCG 3600  
 S E W A Y P P I A Q L A N I R  
 GTCCAAGGATGTGAAGGATGTGAAGGATGTGAAGGAGATTCAGAA 3645  
 S K D V K D V K D V K E I Q K  
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 P L L S S I E L V E .  
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 CTATCCATAACCCGGGCCAGCCTGCAGTAGAGCAGGCGTCACGGC 3960  
 CTGTAGTGCGCTGCGGGAATCTTCCACCCGTTTCGGATGTGGGAAG 4005  
 TTTTGTGTGCTCGGGGCTAACACATTCCAACCATTAATTGATCT 4050  
 TCAAAACGCTTGCAATTTGCTCTATATGGCCGGCCTTGATCCTTGT 4095  
 ATATTTTCACCATCTGACATTTTCTGCACAAGGCGTACAGAAACC 4140

Fig. 2C

ACACGAGGTAAAGTTTCATGGCCGCTTGGCCACTATTGGAAACAC 4185  
GACACACATGTAAACTCTATCCTTGCATTATATTGTAACATCGC 4230  
CTAACATCTCCACGCACTATTCCCTTTGCGTTCCTTATTCATCCTC 4275  
AACTGTATGCCAACCAACAATCATCAAATTATTATTGCAGTTAGT 4320  
CATCATGGATTTCCCAAAGCCGAGGCAGGTTAGAGAGACGAGCCT 4365  
GTTGATGTACTACCTGGACGTCGTGTTTTCTCTACAATGCATTAC 4410  
CCCAAACAACAATTGTCTGGGCAAGAGAGAGTGGCTGTTGACTAT 4455  
ACTAACCTCTGCTCGGCCTACGTACTATGCAACATTGTGCCTGGC 4500  
CCTCCTTTATAAAGAATCCCTCTCAAGCCCTTGCAGAGCCGAACA 4545  
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GCTCCAAGAGTCTCAGAAGCTGTTGGGTGGACTCGACAAGACTTT 4635  
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CAAGATATGATTTTCGATGAGAGGGAAGAGCGAACAACCTATTCACA 5895  
TGTAACCTTAAATTATAGACTTTCAGTATAAACTTTTCGATTATAAG 5940

Fig. 2D